



CLOSURE PLAN CONTENTS AND TECHNICAL REVIEW

3.9 - ANALYTICAL TEST METHODS

Introduction

This section of the closure plan must contain the analytical method(s) to be used for each hazardous constituent of concern listed in Chapter 3.4. There must also be statement that all analyses will be performed by a certified laboratory.

Submittals Required by Applicant

1. Analytical Test Methods - An analytical method describes the equipment and procedures for preparing a sample for analysis and the equipment and procedures used to conduct the analysis. (Note: An analytical method should not be confused with sampling methods which are conducted in the field. Sampling methods are discussed in Chapters 3.7 and 3.8 of these instructions).

a. Approved Test Methods - Since it is U.S. EPA and Department policy to use only the test methods found in SW-846 and CCR, Title 22 for analysis of hazardous constituents. The permit writer should cross check the methods proposed to see if they are contained in those documents. A description of what can be found in both documents are given below:

1) Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Office of Solid Waste and Emergency Response.

There are two types of methods found in SW-846: Sample Preparation Methods (i.e., Method 3050: Acid Digestion of Sediments, Sludges, and Soils) and Analytical Methods (i.e., Method 7020: Aluminum (AA, Direct Aspiration). A sample list of these test methods can be found in Appendix B. For constituents to be analyzed, there should be a corresponding preparation method and analytical method.

Appendix VIII Constituents

Many of the Appendix VIII hazardous constituents can be analyzed by one or more of the methods shown in Figure 2.2, Volume One, Section A, Part I, Chapter Two, Pages two-4 and two-5, SW-846; in every case the method detection limits (MDL's) and practical quantitation limits (PQL's) are specified for each method. (More about MDL's and PQL's later.)

The analytical methods in SW-846 which are useful for Appendix VIII constituents may be summarized as follows:

- i) Metals - Method 6010 (24 parameters)
 - Method 7020 through 7950 (42 methods; 1 parameter per method)
- ii) Organics - Method 8240 (35 volatile organic parameters)
 - Method 8250 (65 semi-volatile organic parameters)
 - Method 8270 (53 semi-volatile organic parameters)
 - Method 8280
 - Methods 8010 through 8150, and 8310 (13 methods; several parameters per method)
- iii) Other parameters - Methods 9010, 9012 (cyanide)

- Methods 9020, 9022 (TOX)
- Method 9030 (sulfide)
- Method 9200 (nitrate)
- Methods 9250, 9251, 9252 (chloride)
- Method 9060 (TOC)
- Method 9040, 9041, 9045 (pH)
- Method 9050 (EC)

For both metal and organic constituents listed in Appendix VIII, there are generally at least two analytical methods (one general method; one specific method) listed in SW 846 which may be used. To develop a "clean closure" removal standard, the method with the lowest MDL for a particular constituent (and hence the lowest PQL) should be selected as the method appropriate for establishing "clean closure" for that constituent.

MDL's are the lowest concentration a given analytical method can achieve when using a reagent blank (i.e., a clean water sample spiked with a hazardous constituent). When analyzing ground water or soil samples instead of reagent blanks the same analysis generally can not achieve the MDL. EPA has taken this into account in SW-846, and has published PQL's. As published in SW-846, PQL's are generally ten times the MDL for ground water samples and several hundred to one thousand times the MDL for soil samples. When setting removal standards for a "non-detectable" "clean Closure", the PQL's for groundwater and soil should be used respectively.

Soil Samples

Soil samples should be analyzed to assure that cleanup targets for soils, based either on total constituents for the direct soil ingestion scenario or on leaching of constituents to ground water and eventual ingestion of drinking water (whichever level is lower), are met.

To analyze for total constituents, it may be necessary to perform the analysis based on an acid digestion procedure, such as Method 3050 of Test Methods for Evaluating Solid Waste 3rd Edition (SW-846)(U.S. EPA, 1986b). Tests for individual constituents (also included in SW-846) would be performed as appropriate, based on the Appendix VIII constituents for which target levels had been established.

The leaching procedure and subsequent analysis of the leachate is necessary to evaluate potential threats to ground water based on residual contaminant levels remaining in the soil. Method 1312 may have the broadest applicability for this leach test, however, other leaching tests may be appropriate under certain case-specific circumstances.

2) California Code of Regulations, Title 22, Chapter 11, Appendices I, III and XI.

Appendix I contains a list of representative sampling methods that will be considered by the Department.

Appendix III contains three Tables which specify the appropriate SW-846 Test Methods for Appendix VII/VIII constituents.

Appendix XI describes an Organic Lead Test Method.

b. Other Analytical Test Methods - When no SW-846 methods or 22 CCR Chapter 11 methods are available, then other methods approved by reputable organizations (e.g., ASTM, AOAC) may be used. In this case, the owner or operator may propose an alternative method which should be reviewed and approved by the Department. If the permit writer receives such a proposal, he/she should submit the proposal to HML for their

approval.

Note: A request for an alternative method to analyze for presence of constituents should not be confused with a Petition for Equivalent Testing or Analytical Method described in 22 CCR 66260.21. A variance is not required for a proposed alternative method required for closure purposes but approval from HML is needed.

2. Use of Certified Laboratory - There must be a statement in the CP saying that a certified laboratory will be used for all analysis. The actual name of the laboratory is not needed.

Key Questions

- ! Is there a test method for each type of equipment/containment structure decontamination procedure?
- ! Is there a table listing the prep method, analytical method, analyte, and detection limits?
- ! Are the test methods listed EPA approved, contained in 22 CCR or approved by a reputable organization?
(Note: Test methods are referenced by a number. It is not necessary for the owner or operator to include the actual procedure in the CP unless it is one that is not pre-approved.)
- ! Is there a statement that a certified laboratory will be used to perform the analysis?

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List of Examples:

List of Attachments:

List of References:

List of Appendices:

Appendix B - sample list of test methods

Figure 2.2, Volume One, Section A, Part I, Chapter Two, Pages two-4 and two-5, SW-846

California Code of Regulations, Title 22, Chapter 11, Appendices I, III, VII, VIII, and XI